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Foreword

U.S. trade in services is a critical element in U.S. export growth, the trade balance, and U.S. global competitiveness. This reflects the importance of services in the US economy, now accounting for more than 80% of the U.S. workforce and GDP. The United States is the largest exporter of services in the world, accounting for close to 15% of global service exports, and in 2005 had a services trade surplus of $66 billion. It would appear, therefore, that services trade probably accounts for a significant number of new U.S. jobs. But we really don't know from the data. In contrast to the manufacturing sector, which is tracked in detail, the United States Government fails to collect meaningful trade data, and we have too few decent studies on this subject. We simply know very little about the impact of services trade on U.S. employment.

Consequently, the debate over services employment in the United States has been dominated by those with compelling anecdotes, who tend to see apparent losses of services (and manufacturing) jobs to India and other countries, never mind full employment in the United States. Clearly, the United States economy is doing well somehow, but it would be nice to know how, and it would also be preferable for U.S. policymakers to understand the balance of employment impacts of our growing services trade if they are to justify and formulate effective trade policies.

This *NBR Analysis* examines the magnitude and changing nature of U.S. cross-border services trade to better understand the implications on U.S. employment and competitiveness. While the findings point to the conclusion that, on balance, trade is good for employment, the key finding is that the lack of adequate U.S. government data on services, including our growing trade in services, makes it impossible to accurately assess these issues. Hence, the study is a clarion call for a major new U.S. government initiative, which must be supported by the private sector, to revolutionize the way data on U.S. services trade is collected and analyzed. Armed with better data and analysis, policymakers would have a firmer foundation on which to support America's economic openness and global leadership, not to mention boost our economic prospects.

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U.S. Services Trade, Employment, and Competitiveness

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Executive Summary

This study examines the changing nature of U.S. trade, focusing on cross-border services trade and corresponding job trends and implications for U.S. global competitiveness.

Main Findings:

U.S. government trade-gathering systems and criteria were established at a time when manufacturing dominated U.S. trade. Thus the amount and availability of data on services and services trade is extremely limited and rudimentary, particularly in comparison to data available for manufacturing trade.

Given these limitations, this study makes maximum use of existing services trade data by connecting service type to service industry in order to identify trade-sensitive industries. Although the creation of these data have wide application, they are used here to track overall job trends in trade-sensitive industries. The main findings are as follows:

- Trade in services, though significantly smaller than trade in manufactures, is nonetheless growing rapidly. Service industries have been more apt to be involved in exporting than in importing; this development reflects the competitiveness of U.S. service exports.
- Industry-level analysis shows that the lion's share of services trade is shifting from traditional travel and transportation services to professional and technical services.
- Since 1990, private services industries added over 22 million jobs, 20% of which were within trade-sensitive industries.
- Workers both in trade-sensitive private services and in manufacturing industries faced higher displacement rates than other workers. The likelihood of re-employment, however, was slightly higher for private service workers than for manufacturing workers in trade-sensitive industries.

Policy Implications:

- Trade policies that promote services trade can boost U.S. economic growth, global trade competitiveness, and domestic employment.
- Federal-level safety net initiatives could be broadened to eliminate the need to determine whether the job loss was related to trade in order to qualify for enhanced benefits under the Trade Adjustment Assistance (TAA) program.
- A serious need exists for the development of comprehensive data systems on U.S. services trade that would allow policymakers to make effective policies—both to promote services trade and to deal with the impact of job losses due to service imports.
- Due to this data gap, the employment impacts and drivers of service trade are not clear. The few studies that have been completed on services trade and employment are hobbled by poor data. There is a vital need for further research to clarify the links between services trade and employment in the U.S.

Trade has been an increasingly important element in driving the growth of the U.S. economy. The United States is the world's largest exporter of services and enjoys a large trade surplus in services. Output of services in the United States for the first time exceeded the output of goods in the late 1960s, and the gap continues to widen. The U.S. economy is now clearly a service economy. Yet currently there is little understanding of the role of trade in services in overall U.S. employment trends. The purpose of this paper is to explore the connection between U.S. services trade and both employment trends and U.S. competitiveness.

Understanding the links between U.S. services trade and employment is critical because of political concern, that has clearly grown as the trade deficit has reached record levels, over the effects of international trade on U.S. industries and workers over the past ten years. Moreover, the anxiety of service industry workers has converged with the anxiety of factory workers fearful of losing their jobs due to imports or the moving of their jobs offshore. The growing integration of the United States with the world economy is broadening rapidly beyond manufacturing to the service sector as well. For the United States and U.S. companies to remain internationally competitive requires accepting this inescapable trend. Given the growing importance of services in U.S. global competitiveness, as well as concerns over services offshoring, services trade is a vital issue that researchers and policymakers need to understand more thoroughly.

Due to the lack of systematic data of services trade by industry, however, literature linking trade in services and employment is sparse. This study seeks to make maximum use of the existing services trade data by connecting service type to service industry, constructing a list of trade sensitive industries, and by tracking overall job trends in trade-intensive industries. The essay also profiles these industries' workforces with a special emphasis on skill, earnings, and educational levels.

The research presented here draws three key findings. First, the private services industries heavily involved in trade have been concentrated in transportation and travel-related services and increasing in professional- and financial-related services. Overall service industries have been more apt to be involved in exporting than importing, reflecting the competitiveness of U.S. service exports. Both exports and imports of private services are growing, yet in recent years, imports have advanced at a greater rate. Second, in sharp contrast with manufacturing, the number of jobs in private services has increased by just over 22 million since 1990, 20% of this increase has been in the traded sectors. Growth has, however, been concentrated in a few industries. Third, workers in both trade-sensitive private services and manufacturing industries face higher displacement rates than workers in other sectors. However, the likelihood of re-

employment was higher for private service workers than for manufacturing workers in trade-sensitive industries.

The study is organized into three main sections. The first section sets out key definitions, the scope of the study, and the strengths and weaknesses of the methodology employed in this research. The second section identifies the private services and manufacturing industries that trade a significant proportion of their output (manufacturing industries are included in this paper to provide comparison to the service sector). This section also reports the major findings of the quantitative analysis and trade research. The final section discusses the implications of research for policymakers and proposes areas for further research.

Key Definitions and Methodology

This section describes the services trade data analyzed, the scope of the study, and key definitions as well as both the methodology used and its limitations. The focus of this study is exclusively on cross-border trade not only because of the direct impact such trade has on the labor market but also because of the greater availability of data on this issue. This study does not examine trade and employment for affiliated services trade; the lack of data makes this linkage even more difficult to measure. The methodology used to determine trade penetration rates originates from similar studies on manufacturing trade and employment.

Definition of Trade in Services

Important to clarify at the outset is what is meant by services trade. Viewed broadly, services trade can be seen as having two components: cross-border trade and trade through majority-owned affiliates. Cross-border trade involves the movement of services across national borders, whereby the residents of one country sell services to the residents of another country.[1] Direct employment effects result from such trade. For example, additional workers are hired here in the United States by U.S. firms that are exporting services overseas, whereas workers in U.S. firms competing with imported services could lose their jobs. There are other, more indirect employment

[1] Cross-border transactions cover both affiliated and unaffiliated transactions between U.S. and foreign residents. Examples of each type are: affiliated transactions consist of intrafirm trade within multinational companies, specifically the trade between U.S. parent and their foreign affiliate of which they own at least 10%; unaffiliated transactions are with foreigners that are not owned by the U.S. party involved in the transaction.

effects from cross-border services trade that are real, though more difficult to measure. For example, lower-cost imported services could help domestic U.S. firms improve their competitiveness by reducing the costs or improving the quality of inputs, which could bolster productivity and lead to job gains as the firms' total export sales increase. Moreover, employment losses in one service industry are offset by gains elsewhere. Because of the direct and more identifiable links between cross-border trade in services and the labor market, the discussion of trade in services in this study focuses exclusively on cross-border trade. Unless noted otherwise, all trade services statistics reported in the tables and figures are for cross-border trade in private services.[2] Likewise, the trade in services data used in the methodology is for trade crossing national boundaries and therefore has the same convention as goods trade in that both cross national borders. This is an important similarity in that the methodology employing these data originated in studies of goods trade.

A second channel of delivery of services sold in international markets is sales through foreign affiliates of multinational companies, which from an U.S. viewpoint, are sales to foreigners by foreign affiliates of U.S. companies. As such, these sales are not considered U.S. international transactions and do not affect our trade balance. Data published by the Bureau of Economic Analysis (BEA) captures the amount of this trade. Wedged between affiliated and unaffiliated trade is a no-trade transaction. A service transaction between a foreign subsidiary and an unaffiliated company in that foreign nation is not considered trade.[3] With trade between affiliates, the service is delivered where the service is received—in the home country of the foreign worker delivering the service. Since the service is delivered onsite by the affiliate, there is no border crossing and hence no direct employment effect. Important indirect employment impacts result, however, from trade among affiliates. An excellent discussion of this issue as it pertains to the manufacturing sector is provided by Mathew Slaughter, who analyzed job trends in U.S. multinationals from 1991 to 2001 and found that for every job a multinational created abroad in an affiliate, nearly two U.S. jobs were created in the parent company.[4] This suggests that, while the present study focuses strictly on the more measurable employment impacts of direct, cross-border services trade, further studies are needed

[2] The data are available from the Bureau of Economic Analysis (BEA), which launched a long-term data improvement program for international services in 1982 that has added data on several new and growing service categories. See Obie G. Whichard and Maria Borga, "Selected Issues in the Measurement of U.S. International Services," *Survey of Current Business* 82, no. 6 (June 2002): 36–56.

[3] There is one exception. If the service is provided by workers who are on-site in the foreign country for one year or less, the transaction is considered an export by BEA.

[4] Matthew J. Slaughter, "Globalization and Employment by U.S. Multinationals: A Framework and Facts," *Daily Tax Report* 58, BNA, Inc., March 2004.

that would focus on the employment impact of affiliated trade. Given that affiliated services trade exceeded the volume of cross-border services trade in the last half of the 1990s and that the gap has continued to widen, the need for such studies becomes even more relevant.[5] This consideration suggests that there could be significant and underappreciated indirect employment impacts.

Focusing on cross-border services trade and its similarities to cross-border goods trade will contribute to the body of knowledge in a vital area of the U.S. economy. Moreover, such a contribution should provide a sound foundation from which to launch further studies in an area that is changing the landscape of both the U.S. economy and the global economy as well as the means by which companies strive to maintain their competitiveness in this environment. By identifying import- and export-intensive industries, such studies will also be able to identify the industries likely to be affected by more open trade.

Methodology in Determining Trade-Sensitive Industries

Trade in manufactured goods trade still dominates national trade statistics; services trade, however, not only is growing and changing but also is helping to promote goods trade.[6] Trade in goods can also promote services trade—e.g., such service transactions as shipping and handling. The identification of the industries—both in services and manufacturing—with current, significant trading activity is important for public policy. A description of the methodology and its limitations when applied to service industries follows.

The methodology to determine which U.S. private service and manufacturing industries are trade-sensitive uses two measures.[7] They are

(1) $M/M+S_i$

(2) X/ S_i

where M = U.S. imports, X = U.S. exports, and S_i = U.S. production of services or merchandise (shipments).

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[5] Erin Nephew, Jennifer Koncz, Maria Borga, and Michael Mann, "Cross-Border Trade in 2004 and Sales Through Affiliates in 2003," *Survey of Current Business* 85, no. 10 (October 2005): 25–77.

[6] There is an argument that more open trade in services facilitates across border production chains in goods. See Alan V. Deardorff, "International Provision of Trade Services, Trade, and Fragmentation," *Review of International Economics* 9, no. 2 (May 2001): 233.

[7] This direct approach was pioneered to identify trade-sensitivity manufacturing industries. See, for example, Gregory K. Schoepfle, "Imports and Domestic Employment: Identifying Affected Industries," *Monthly Labor Review* 105, no. 8 (August 1982): 13–26.

This approach aims to capture how much output (or supply) available for an industry involves trade. The resulting figures are termed trade penetration rates.[8] In order to compute the figures, both the amount of goods or service that is traded and the corresponding amount produced are needed for a specific industry. Export penetration (determined by measure 2) is the value of exports from an industry divided by the value of the commodity or service produced by it. Import penetration (determined by measure 1) is different, as the amount of imports coming into the country adds to the services and goods produced here. Thus to determine the total amount of a service or good that is available, imports must be added to the total produced domestically. Import penetration is the amount of imports in a specific North American Industry Classification System (NAICS) industry divided by supply, which is output plus imports in that industry.

Data for goods trade are readily available at the four-digit NAICS level, but data for services trade are not. Trade in services data from the BEA is available only by service type. These data were concorded by the authors to the most appropriate four-digit NAICS industry. The data are more fully discussed in **Appendix I** and the concordance is presented in **Appendix II**. Import and export penetration rates were calculated for all four-digit private service and manufacturing industries for which data were available.

It should be noted that both the concordance of trade by service type to service industry and the identification of trade-sensitive industries have wider application than employed here. Possibilities include the examination of trade by industry clusters (like the IT-sector) both geographically and sectoraly.

The two tables in Appendix I show the distribution of detailed industries by average import and export penetration rates for the 1997 to 2004 period. This time period was chosen because 1997 marked the first year for which detailed trade in services data became available and 2004 is the most current year for these data. Threshold levels were chosen so that trade-sensitive industries would include those in which a large share of output was traded. Although the thresholds are arbitrary, they are in line with previous studies and with the amount of trade in the sector.[9] For manufacturing industries, those with an average import or export penetration of 20% were deemed trade sensitive. For services, where trade is less widespread, those with an average import or export penetration of 10% were deemed trade sensitive. In determining trade sensitivity, important to consider as well are industries undergoing a reasonable growth in trade;

[8] See Schoepfle, "Imports and Domestic Employment."

[9] See Schoepfle, "Imports and Domestic Employment"; and Robert W. Bednarzik, "An analysis of U.S. industries sensitive to foreign trade, 1982–87," *Monthly Labor Review* 116, no. 2, (February 1993): 15–32.

that is, a service may be traded at a low level but be growing appreciably. Accordingly, manufacturing industries with an average annual increase in import penetration of two percentage points or more or in export penetration of one percentage point or more were also deemed trade sensitive. The threshold chosen for trade sensitivity for service import and export penetration rates was an average annual increase of 0.4 percentage points or more. Service industries growing in trade of these magnitudes were added to the trade sensitive list.

For both private service and manufacturing industries, the lion's share of the industries deemed trade sensitive was a result of their meeting the first threshold level of having a significant portion of their output traded, on average, over the 1997–2004 period. Moreover, if having to report a significant growth in trade over this period was the only criterion necessary to be considered trade sensitive, the list of trade-sensitive industries would have contained mainly import-sensitive manufacturing industries because of significant increases in goods imports.

Limitations of the Methodology

There are a few limitations to the methodology employed here; they include (1) the appropriateness of the methodology for all private service industries and (2) arbitrary cutoff points. The methodology is not applicable to all private services industries. The most obvious case is the private service imports in the food service and drinking places as well as in other tourist-related industries. This category is the money spent abroad by U.S. tourists and does not have a U.S. labor market impact, although exports in eating and drinking places and entertainment could have a positive U.S. labor market effect, as this is a measure of spending by foreign tourists here in the United States. Imports in food service and drinking places do not fit the conventional understanding of tradable services and, as such, are excluded from the analysis.

Some aspects of the offshoring phenomenon, or the relocation of job tasks abroad, may be missed. Some tasks are more closely related to occupation than to industry, especially those in the IT sector. To the extent that is the case, looking only at industries may understate or overstate the role of international trade in services.[10] Examining the occupational make-up of trade-sensitive industries to see how this make-up has changed over time, however, is possible. This is done to a limited extent later in this

[10] Six industries (four in services and two in manufacturing) have been identified as comprising the IT-sector. The two manufacturing industries, computer and electronic products (NAICS 3341) and communication equipment (NAICS 3342), were deemed trade sensitive here but none of the four service industries were. See Bednarzik, "Restructuring information technology," *Monthly Labor Review* 128, no. 8 (August 2005): 11–22.

study. Given some of the limitations, employing an alternative methodology and comparing results may be useful.[11]

The limitation imposed by using cutoff points is inevitable. Using two criteria to determine trade sensitivity minimizes somewhat the arbitrariness of selecting cutoff points. For example, 24 manufacturing industries fell between a one and two average annual percentage point change for import growth, or just below the cutoff level for deeming them import sensitive. However, 15 of the 24 industries (63%) were considered import sensitive because they satisfied the first criterion of having an average import or export penetration ratio of 20% or more from 1997 to 2004. The two cutoff points selected for service industries trade had clear demarcations between the upper and lower levels.

There is also the issue of product differentiation. Some products are not highly differentiated from other products and hence could easily be replaced by imports. On the other hand, if a product was highly differentiated, its sensitivity to imports would be lessoned. Therefore, it is possible that industries with highly differentiated products or services facing import competition may not show many if any job losses.

Key Findings

This section describes three key findings of the industry-level analysis and research. First, the private services industries heavily involved in trade were concentrated in transportation and travel-related services and increasing in professional- and financial-related services. Overall, service industries were more apt to be involved in exporting than in importing, reflecting the competitiveness of U.S. service exports, though imports are growing more quickly than exports. Second, in sharp contrast with manufacturing the number of jobs in private services increased by just over 22 million since 1990, and 20% were in the traded sectors. The growth was concentrated, however, in a few industries. During a period of slow job growth between 2000 and 2005, export-sensitive service industries accounted for a disproportionate amount of the job growth, while import-sensitive service industries lost jobs. Third, workers in both trade-sensitive private services and manufacturing industries faced higher displacement rates than

[11] For example, Jensen and Kletzer use an indirect approach that uses local geographical (state), employment data and determines industry concentration levels on the premise that nontraded services will not exhibit geographical concentration. Likewise, occupational concentrations can be determined. However, the industry and occupation level are only at the 2-digit level and export and import sensitivity are not distinguished. See Jensen and Kletzer, "Tradable Services."

other workers. The likelihood of re-employment was slightly higher for private service workers than for manufacturing workers in trade-sensitive industries.

Industries Identified as Significant Traders

The United States exports over 20% of the goods the country produces, while imports of goods add over 35% to what is already produced. In services, although the United States exports only slightly more than 5% of the country's services output, the figure is growing; this figure was less than 2% in the 1950s. Imports of services added about 4% to U.S. output of services as far back as the 1870s, before falling along with the reduction in overall trade in the 1920s and 1930s. Trade in services accelerated in the 1970s and has continued to grow alongside trade in goods. A freer flow of services enables even more goods to be traded. For example, a company is likely to sell computers abroad if that company can service and program the computers as well. In 2005 U.S. trade in goods posted a deficit of $782.7 billion, while trade in services posted a $66.0 billion surplus.[12] Of total across-border trade volume, services accounted for 22% and goods for 78% in 2004.

Not surprisingly, there were more trade-sensitive industries in manufacturing than in private services. At the four-digit NAICS level, four of ten manufacturing industries were import sensitive and three of ten were export sensitive,[13] whereas, only about two of ten private service industries were deemed import or export sensitive. See **Appendix III** for a complete list of export- and import-sensitive services and manufacturing industries. Important to note is that most trading industries do not just export or just import, but are very likely to do both. For example, roughly half of the manufacturing industries that were import sensitive were also export sensitive, and most of the service industries that were import sensitive were also export sensitive. Clearly, in many industries, two-way trade is a common way of doing business.

[12] These figures are taken from the BEA, which are collected annually. Note that the U.S. Census Bureau export and import figures for cross-border services trade are slightly higher than BEA numbers, and are collected monthly. The primary reason is definitional. The Census Bureau defines "other private services" more broadly: Census figures treats services imbedded in goods (e.g., software) as services, leading to higher numbers. In 2004, for example, the most recently available data for cross-border services trade was $323 billion exports and $248 billion imports, a surplus $65 billion. Monthly international transactions data collected by Census Bureau, yields $344 billion exports and $290 billion, for a surplus of $54 billion.

[13] The list of export sensitive manufacturing industries developed here was checked against an unpublished list developed by the Bureau of Labor Statistics (BLS) as a part of the Current Employment Statistics (CES) program. Twenty of the 24 four-digit export sensitive manufacturing industries were also designated as sensitive by the BLS.

Significant traders in private services were concentrated in transportation and travel-related services. There was a clear dichotomy between trade and little or no trade in private services. For example, over the 1997 to 2004 period about 70% of the private service industries examined in this study imported less than 2% of the total output in their industry, and about 50% exported less than 2% of their total output, on average.

In contrast, nearly all of the manufacturing industries examined were involved in trading. Significant traders in manufacturing were in apparel and leather, electrical and electronic equipment, and transportation equipment. Very few industries reported that only a low share of their output was traded. For example, fewer than 5% of manufacturing industries imported less than 2% of the total output in their industry and fewer than 10% of manufacturing industries exported less than 2% of their total output, on average, over the 1997 to 2004 period. Thus a major difference between private services and manufacturing industries is the lack of widespread trading in private services. Service industries also were more apt to be involved in exporting than in importing, which reflects the competitiveness of U.S. service exports.

Changing Distribution of Cross-Border Trade in Services

The magnitude of cross-border trade in services by type can be seen in **Table 1**. In 2004 the United States exported $323.3 billion worth of private services while importing $258.1 billion, an approximate $65 billion surplus. The major private services types are travel-related and business, professional, and technical services. All of the major types of private services trade have increased over the past several years. While the absolute dollar amount of private services trade has been increasing, the composition is changing. There has been a shift in the distribution of services trade away from traditional transportation services to other private services. Other private services include business, professional and technical services, education, financial, insurance, and telecommunications.

In 1992 transportation services accounted for 57% of services exports and other private services for about 31% (see **Figure 1**). The remaining 12% of services exports were royalties and license fees, which are franchising fees and royalties paid for the use of registered trademarks, patents, and copyrights and licensing fees for use of recordings, computer programs, and so forth. By 2005 transportation services had declined to 40% of services exports and other private services had risen to 44%. Much of the transportation services reflect the shipment of manufactured goods by sea and air. A parallel—but somewhat less dramatic—shift also occurred in services imports.

TABLE 1 Amount of U.S. cross-border services trade by type, 2004 ($million)

	Exports	Imports
Travel	74.5	65.6
Passenger fares	18.9	23.7
Other transportation	36.9	54.2
Royalties and license fees	52.6	23.9
Business, Professional, and Technical	71.0	40.7
Other private services*	69.5	49.9
Total	$323.3	$258.1

SOURCE: Bureau of Economic Analysis (BEA) data.

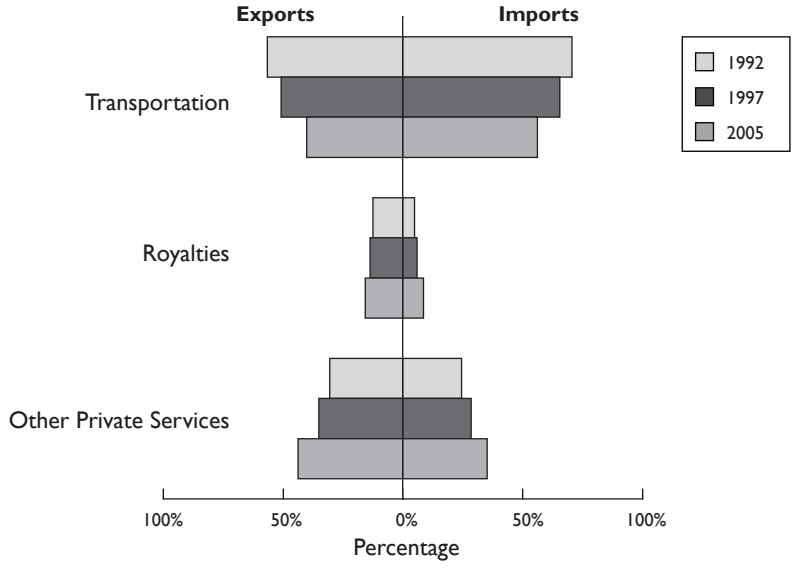
* Includes education, financial, insurance, and telecommunications.

An examination of the individual components that constitute the other private services is possible beginning in 1997 when detailed (cross-border services types were first published (see **Figure 2**). The largest component of other private services is business, professional, and technical services. This component's share of services exports has held steady between 1997 and 2004, at roughly 51%. The absolute amount of exports and imports of business, professional, and technical services increased between 1997 and 2004, although not faster than other services. Financial and insurance services posted the largest gains in exports, more than doubling to reach $33.5 billion in 2004.

For imports, the distribution of other private services imports shifted dramatically as insurance services grew and telecommunication services plunged between 1997 and 2005. Telecommunication services include the transmission of sound images or other information by telephone, telex, telegram, radio, television (cable and broadcasting), satellite, electronic mail, facsimile, and on-line access services. Since telecommunications imports primarily capture the fees paid by U.S. residents for international telecommunication charges and these costs have declined, the dollar value of these services has declined even though more people may be using them. Sales of reinsurance (the transferring of risk between insurance companies) accounts for the majority of cross border insurance trade—70% of exports and 88% of imports. Imports of business, professional, and technical services showed little change between 1997 and 2005.

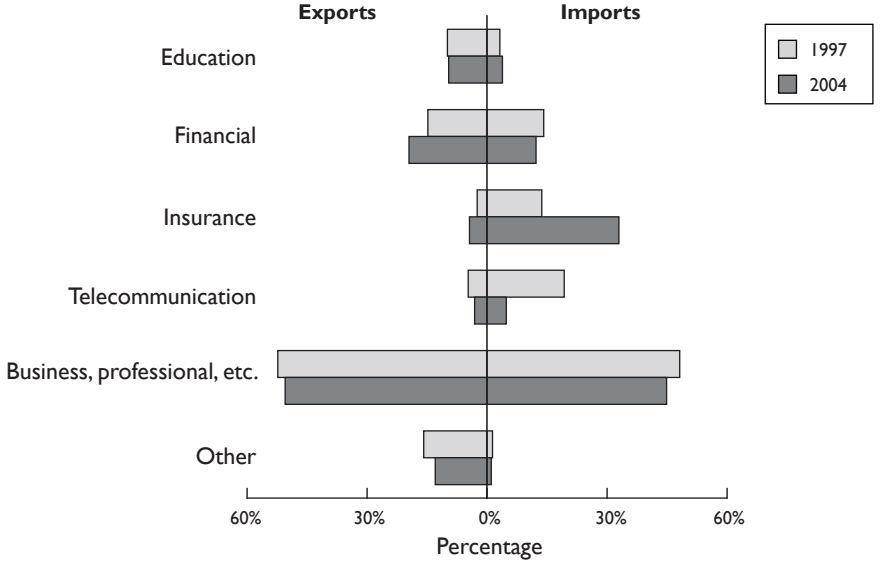
The business, professional, and technical services group includes a wide range of service industries. Notable changes between 1997 and 2004 include increasing exports and imports of computer and information services to $8.5 and $5.8 billion, respectively. Imports of management and consulting services also reached over $5 billion in 2004.

FIGURE 1 Distribution of U.S. services trade by service type, 1992–2005



SOURCE: BEA data.

FIGURE 2 Distribution of other private U.S. services by service type, 1997 and 2004



SOURCE: BEA data.

Job Trends in Trade-Sensitive Industries

Putting job changes in trade-sensitive industries into context by comparing them to overall job totals in the U.S. labor market is important. When studying job trends, it is valuable to examine a long time horizon. For example, labor analysts typically analyze peak-to-peak points in the business cycle to determine which groups have exceeded their previous high points. The U.S. economy experienced economic peaks in July 1990 and in March 2001. Consequently, this study will examine job changes between 1990 and 2005, including 2000 as an economic turning-point year.[14]

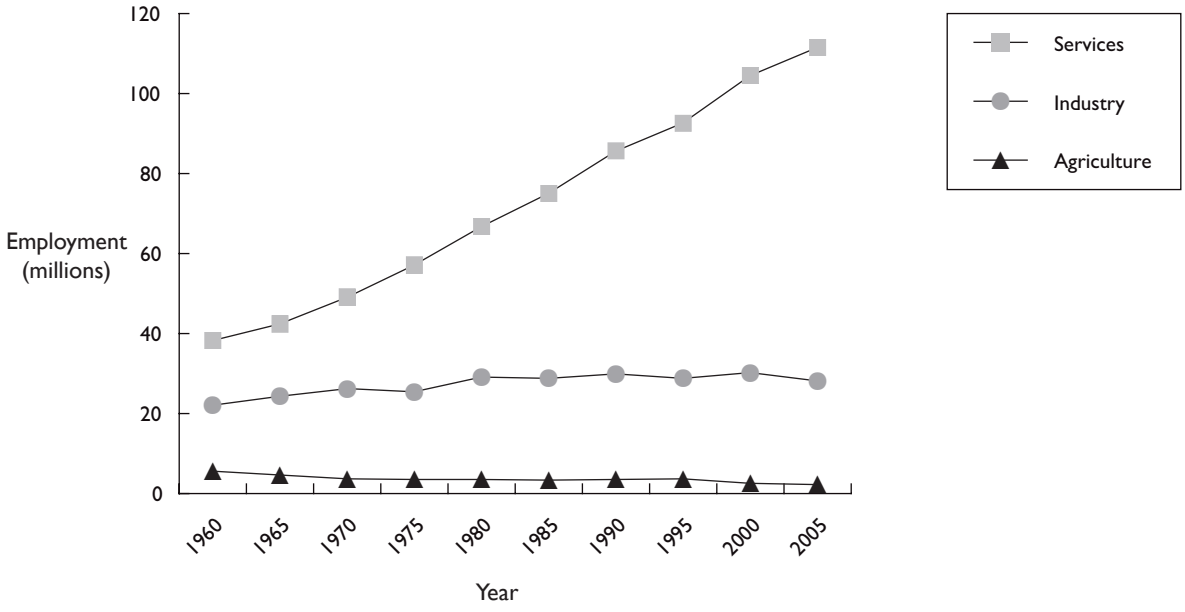
In 2005, the number of jobs in the United States was 133.5 million, an increase of 24 million jobs since 1990. Nearly 80% of all U.S. workers are now employed in service-producing jobs. **Figure 3** illustrates the long-term growth of service-sector employment relative to agriculture and industry, which includes manufacturing, construction, and mining. In the 1990s job levels in manufacturing did not change much, in sharp contrast to the strong growth in the number of private services jobs. This picture changed dramatically between 2000 and 2005 when total manufacturing lost over three million jobs, most of which were in production, and double-digit growth in private services fell to less than 4% (see **Table 2**).

International trade plays an important role in these job trends. Trade has both a positive and a negative impact on the job market. To the extent that international trade boosts economic growth, it will have an overall positive effect on the U.S. economy and the employment picture. Moreover, as exports grow, job gains could follow to the extent that additional workers are needed to meet the expanded demand abroad. Additionally, cheaper imports that serve as inputs to the production process will lower costs and allow firms to perhaps boost hiring. On the downside, to the extent that U.S. companies and consumers stop buying from domestic producers and instead buy imports, jobs will be lost. The off-setting nature of this job process has led economists to declare that the impact of international trade is largely distributional. What follows is an aggregate view of job trends in trade-sensitive industries. The employment numbers illustrated here are "net" figures, or the difference between job gains and losses in a specific industry. Therefore, even in industries with job losses, job gains could have occurred—and vice versa for industries posting gains.

Like manufacturing industries, service industries that export significantly also import significantly. For example, all of the service industries in the transportation

[14] The number of jobs and wage rates in specific industries are available from the Bureau of Labor Statistics CES program, a national survey of a representative sample of establishments, which are classified according to their major activity by NAICS code.

FIGURE 3 Trends in U.S. employment by economic sector, 1960–2005



SOURCE: Bureau of Labor Statistics (BLS) data.

TABLE 2 Job trends by major sector and trade sensitivity, 1990–2005 (in thousands)

	1990	1995	2000	2005
Manufacturing jobs	17,695	17,241	17,263	14,232
Import sensitive	7,118	7,019	6,920	5,287
Export sensitive	5,764	5,525	5,622	4,477
Private services jobs	67,349	74,710	86,346	89,527
Import sensitive	3,840	3,904	4,396	4,278
Export sensitive	11,792	13,157	15,056	15,903
Other*	24,443	25,347	28,176	29,704
Total number of jobs	109,487	117,298	131,785	133,463

SOURCE: BLS data.

NOTE: Import- and export-sensitive industries are not additive; they include many of the same industries. Please see Appendix I for a list of all trade-sensitive industries.

* Includes mining, construction, and public services.

arena identified as import sensitive were also export sensitive. In sharp contrast with manufacturing, since 1990 there has been an increase of just over 22 million in the number of jobs in private services, 20% of which has come in the traded sector. Between 1995 and 2005, over 2.7 million service jobs were created in cross-border trade sensitive industries. In the slow growth period for private services between 2000 and 2005, the number of jobs in export-sensitive service industries grew, while those in import-sensitive service industries fell somewhat.[15] Between 2000 and 2005, export-sensitive service industries gained almost 900,000 jobs while the import-sensitive service industries lost over 100,000 jobs. The growth was concentrated, however, in a few industries—most notably in the food services and drinking places industry, which is heavily tied to travel and tourism.[16] The export-sensitive portfolio management, investment advice, and other activities industry also continued to grow in the current period. The industry has added over 160,000 net new jobs since 1990.

There was not much difference in job trends between import- and export-sensitive service industries from 2000 to 2005. Most traded service industries posted job losses. Air transportation lost 113,000 jobs between 2000 and 2005; smaller losses were visible in insurance carriers and software publishing, both of which are import sensitive (see **Table 3**). The terrorist attacks of September 11, 2001, however, also played a role in these job trends. Travel-related industries, which were already experiencing weakening demand (mainly from business travelers) in the summer of 2001, suffered even more following the attacks.[17] Additionally, there was little difference in the earnings profile between import- and export-sensitive private services: one out of three industries paid less than the national average. Both low- and high-wage private service industries lost jobs between 2000 and 2005.

Total manufacturing lost over three million jobs between 2000 and 2005. Jobs in import-sensitive manufacturing began declining sooner and accounted for nearly half

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[15] This is broadly consistent with a recent study by van Welsum and Reif who categorized jobs by their likelihood of being offshored. They examined the 1995 and 2003 period and found that exports of business services are positively related to employment, and imports of business services were not related to employment. See Desiree van Welsum and Xavier Reif, "Potential Offshoring: Evidence from Selected OECD Countries," in *Brookings Trade Forum 2005, Offshoring White-Collar Work* ed. Susan M. Collins and Lael Brainard (Washington, D.C.: Brookings Institution Press, 2006).

[16] For example, there are 41 million foreign visitors annually to the United States, spending an estimated $82 billion. See U.S. Chamber of Commerce, "Jobs, Trade, Sourcing and the Future of the American Workforce," April 2004, http://www.uschamber.com/NR/rdonlyres/ece75tzrnbsudook6r5iv2tmnnq4r6hi5bgmyvgnnmaqhegwikfjo3l5oybd6ykda4odm6tfkiddpzgfjfqoatioifb/outsourcing.pdf.

[17] For a discussion of the job impact of September 11th, see David S. Langdon, Terence M. McMenamin, and Thomas J. Krolik, "U.S. Labor Market in 2001: Economy Enters a Recession," *Monthly Labor Review* 125, no. 2 (February 2002): 3–34.

TABLE 3 Employment and earnings of trade-sensitive private service industries, select years

NAICS	Industry	Number of Jobs (in thousands)				Avg. hourly earnings of production workers, 2005	Import and export penetration rates, 1997–2005[2]	
		1990	1995	2000	2005		Avg. ratio	Avg. annual % change
Import sensitive								
4811	Scheduled air transportation	502.7	472.7	569.5	456.8	$17.19	85.5	–3.720
4812	Nonscheduled air transportation	26.2	38.1	44.8	44.5	$24.89	85.5	–3.720
4821	Rail transportation	271.8	232.5	231.7	228.3	$19.98	15.4	–0.050
4831	Deep sea, coastal, and great lakes water transportation	35.4	31.8	35.9	37.3	$18.67	29.2	0.405
4841	General freight trucking[1]	608.6	683.0	768.0	747.1	$17.54	15.4	–0.050
4881	Support activities for air transportation	96.3	104.1	141.0	146.8	$15.07	71.6	–3.733
4883	Support activities for water transportation	90.6	92.0	96.7	93.9	$27.12	94.5	–2.971
5112	Software publishers	98.2	157.2	260.6	235.9	$38.11	8.0	0.428
5331	Lessors of nonfinancial intangible assets (except copyrighted works)	13.9	19.0	27.8	27.1	n.a.	8.0	0.428
5241	Insurance carriers	1,338.4	1,395.7	1,432.7	1,383.7	$21.67	0.9	0.097
5242	Agencies, brokerages, and other insurance/financial activities	556.7	677.8	787.8	876.7	$18.88	0.9	0.097
Export sensitive								
4811	Scheduled air transportation	502.7	472.7	569.5	456.8	$17.19	85.5	–3.720
4812	Nonscheduled air transportation	26.2	38.1	44.8	44.5	$24.89	85.5	–3.720
4821	Rail transportation	271.8	232.5	231.7	228.3	$19.98	15.4	–0.050
4831	Deep sea, coastal, and great lakes water transportation	35.4	31.8	35.9	37.3	$18.67	29.2	0.405
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4883	Support activities for water transportation	90.6	92.0	96.7	93.9	$27.12	94.5	–2.971
5112	Software publishers	98.2	157.2	260.6	235.9	$38.11	23.3	0.382
5331	Lessors of nonfinancial intangible assets (except copyrighted works)	13.9	19.0	27.8	27.1	n.a.	23.3	0.382
5239	Portfolio management, investment advice, and other activities	119.7	148.8	238.8	283.6	$24.70	6.3	0.611
5320	Rental and leasing services	514.2	557.4	666.8	646.4	$14.03	4.2	0.407
7100	Arts, entertainment, and recreation	1,132.0	1,459.4	1,787.9	1,890.7	$12.18	75.7	–1.644
7211	Traveler accommodations	1,581.5	1,617.2	1,837.4	1,795.5	$10.75	75.7	–1.644
7220	Food services and drinking places	6,539.6	7,389.1	8,189.1	9,099.4	$ 8.01	75.7	–1.644
8113	Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	161.3	154.6	160.7	170.0	$16.89	10.5	-0.047

SOURCE: Based on BLS and BEA data.

[1] Data are long distance trucking NAICS 48412.

[2] Some of the 4-digit NAICS industries have the same penetration rates because the trade data by service type could not be concorded finely. For example, service type travel covers three 4-digit NAICS industries—entertainment, lodging, and dining.

of the overall job decline in manufacturing since 2000. Devastating losses occurred in apparel and leather manufacturing. Since 1990, 770,000 jobs have been lost in apparel and leather, most notably in cut-and-sew apparel manufacturing and footwear. Major job losses have also occurred in computer and electronic product manufacturing, especially in semiconductors[18] and in computer and peripheral equipment. Motor vehicle parts manufacturing lost 160,000 jobs since 2000. All the import-sensitive manufacturing industries, except pharmaceuticals, posted relatively sizeable job losses.

Jobs in export-sensitive manufacturing industries were not spared, although losses were somewhat less than in import-sensitive manufacturing industries. For industries that were only export sensitive, significant job losses still occurred between 2000 and 2005. The largest losses occurred in fabric mills and in aerospace product and parts manufacturing. Yet job growth was expected in industries that were significant exporters, especially if those industries were also not significant importers. A partial answer to the question of what actually occurred may lie with imports. All of the export-sensitive "only" manufacturing industries posted average double-digit and increasing import penetration rates over the 1997–2004 period. As indicated in the first table in Appendix I, nearly seven out of every ten manufacturing industries trade to more than a marginal degree. Thus global competition is prevalent throughout most of the manufacturing sector—and lower-wage industries are those facing the stiffest competition. In 2005 about half of the import-sensitive manufacturing industries had jobs paying less than the U.S. average of $16.11 per hour for production workers. In contrast, only about one-fourth of the export-sensitive, manufacturing industries pay less than this (see **Table 4**). Moreover, many of the deepest job losses noted took place in low-paying industries.

The job market bottomed out at 130 million jobs in 2003 and since then has been gradually climbing. As we have seen, manufacturing jobs are still being lost, intimating that the fast pace of service job growth is pulling the total upward. The upward pace has slowed, however, and not all private services have been left unscathed. Though the causal mechanism is unclear, industries facing import competition seem not to fare as well as other industries in terms of job growth. The employment data are from the Current Employment Survey (CES), which is drawn from company reporting.[19] This

[18] For documentation of the history of jobs moving offshore in these industries see "Offshoring: U.S. Semiconductor and Software Industries Increasingly Produce in China and India," United States Government Accountability Office, September 2006.

[19] The Current Employment Survey is a large monthly survey of business establishment.

difference in job growth is verified by household surveys, which tell a similar story.[20] Though an issue in both sectors, joblessness is a far greater concern in manufacturing than in private services. The following trade-sensitive industries posted very significant unemployment rates (close to 8% or higher) in 2005: cut and sew apparel, footwear, other transportation equipment, cutlery and handtools, and fabric mills in manufacturing, as well as water transportation, food services, and drinking places in the service sector.

To further explore the possible relationship between trade-sensitivity and joblessness, we turn to displaced worker data.[21] In a series of surveys, people were asked to recall over the three years prior to the survey whether they lost their job because their company closed down, moved, etc. The most recent survey, conducted January 2006, asked respondents to recall their work situation between January 2003 and December 2005. The survey identified a little more than 8 million displaced workers who were 20 years of age and over.[22] Because of the large variation in size of industries, a rate of displacement has been defined as the number of workers displaced in an industry divided by the number of workers in that industry.[23] The displaced worker rates for trade-sensitive industries are illustrated in **Table 5**.

Nearly 6% of nonagricultural workers aged 20 years and over reported being displaced between January 2003 and December 2005. The displacement rate in manufacturing was more than twice the rate in the private service industries. In each sector, trade-sensitive industries recorded higher displacement rates than other industries. Since the industry data were only available at the three-digit NAICS level, it is difficult to distinguish between import-sensitive and export-sensitive industries, as many fall in both groups. Workers in all trade-sensitive industries exhibited an above average rate of displacement in 2005.

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[20] Data are from the U.S. monthly survey of households, the Current Population Survey (CPS), which is used to determine the National unemployment rate.

[21] Since 1984, the Employment and Training Administration of the U.S. Department of Labor has sponsored surveys that collect information on workers who were displaced from their jobs. These surveys have been conducted biennially as supplements to the CPS. Displaced workers are defined as persons 20 years of age and older who lost or left jobs because their plant or company closed or moved, there was insufficient work for them to do, or their position or shift was abolished. The period covered in the most recent survey was 2003 to 2005, the three calendar years prior to the January 2006 survey date.

[22] The analysis will focus on the nearly 7.5 million private, nonagricultural wage and salary workers displaced, as this is the group for which industry affiliations are available.

[23] The rate is the number of wage and salary workers displaced divided by the total number of wage and salary workers and the self employed for each industry group. The latter figure was used because detailed industry data by age and class of worker were not available.

TABLE 4 Employment and earnings of trade-sensitive manufacturing industries, select years

NAICS	Industry	Number of Jobs (in thousands)				Avg. hourly earnings of production workers, 2005	Import and export penetration rates, 1997–2005	
		1990	1995	2000	2005		Avg. ratio	Avg. annual % change
3151	Apparel knitting mills	111.8	105.7	68.9	36.6	$11.03	20.7	1.977
3152	Cut and sew apparel mfg.	775.9	665.9	393.5	202.8	$10.05	53.7	2.140
3159	Apparel accessories and other apparel mfg.	41.4	42.5	34.4	20.8	$10.54	48.6	2.381
3161,9	Leather and hide tanning and finishing and allied product mfg.	50.7	47.8	38.0	21.6	$11.51	35.4	1.101
3162	Footwear mfg.	82.5	57.1	30.7	17.9	$11.50	82.4	0.724
3254	Pharmaceutical and medicine mfg.	207.2	227.8	274.4	288.5	$21.31	21.4	1.932
3271	Clay product and refractory mfg.	83.6	85.0	82.0	61.4	$15.08	32.6	1.449
3311	Iron and steel mills and ferroalloy mfg.	186.8	154.2	135.0	95.8	$23.55	20.5	1.563
3314	Nonferrous metal (except aluminum) production and processing	109.1	103.1	96.3	71.8	$20.08	38.0	1.425
3322	Cutlery and handtool mfg.	78.8	78.1	79.0	55.9	$15.49	22.3	0.705
3325	Hardware mfg.	57.2	55.0	49.9	35.0	$15.73	22.7	1.481
3326	Spring and wire product mfg.	77.5	82.3	80.8	59.4	$15.22	26.1	0.923
3329	Other fabricated metal product mfg.	343.5	317.1	329.8	264.4	$16.58	20.7	0.920
3331	Agriculture, construction, and mining machinery mfg.	228.7	214.6	222.3	209.4	$15.90	21.0	1.395
3332	Industrial machinery mfg.	151.8	164.0	163.2	124.4	$17.80	23.9	0.243
3333	Commercial and service industry machinery mfg.	146.7	143.7	147.1	110.8	$19.18	32.4	0.444
3335	Metalworking machinery mfg.	266.7	273.3	273.5	202.2	$17.86	21.6	–0.008
3336	Engine, turbine, and power transmission equipment mfg.	114.1	115.3	111.4	97.1	$18.93	22.5	0.968
3339	Other general purpose machinery mfg.	335.0	347.0	343.0	264.9	$16.82	24.0	0.909
3341	Computer and peripheral equipment mfg.	367.4	295.6	301.9	206.5	$22.75	42.3	0.796
3342	Communications equipment mfg.	231.5	232.8	247.7	148.1	$18.05	22.3	2.467
3343	Audio and video equipment mfg.	60.1	53.8	52.1	32.3	$19.96	75.3	2.370
3344	Semiconductor and other electronic component mfg.	574.0	571.0	676.3	451.1	$17.04	33.4	–0.398
3346	Manufacturing and reproducing magnetic and optical media	43.3	53.3	63.4	44.3	n.a.	20.7	0.761
3351	Electric lighting equipment mfg.	80.8	81.4	84.8	61.1	$15.44	31.1	2.008
3352	Household appliance mfg.	113.7	111.1	105.7	86.1	$14.27	30.8	2.619
3353	Electrical equipment mfg.	243.6	219.1	209.7	152.0	$15.32	25.7	1.631
3359	Other electrical equipment and component mfg.	195.0	180.5	190.6	136.4	$15.75	21.0	1.156
3361	Motor vehicle mfg.	271.4	294.7	291.4	249.7	$29.03	34.0	1.011
3363	Motor vehicle parts mfg.	653.0	786.9	838.5	678.0	$21.09	20.1	1.125
3369	Other transportation equipment mfg.	35.0	40.1	39.9	38.6	$18.53	24.8	1.373
3371	Household and institutional furniture and kitchen cabinet mfg.	398.0	398.5	440.3	380.1	$13.14	22.1	1.812
3399	Other miscellaneous mfg.	402.5	420.9	423.0	348.2	$13.57	43.4	0.780

TABLE 4 Employment and earnings of trade-sensitive manufacturing industries, select years (continued)

NAICS	Industry	Number of Jobs (in thousands)				Avg. hourly earnings of production workers, 2005	Import and export penetration rates, 1997–2005	
		1990	1995	2000	2005		Avg. ratio	Avg. annual % change
3132	Fabric mills	270.2	246.2	191.9	104.3	$12.79	22.2	2.698
3159	Apparel accessories and other apparel mfg.	41.4	42.5	34.4	20.8	$10.54	35.3	–1.608
3161,9	Leather and hide tanning and finishing and allied product mfg.	50.7	47.8	38.0	21.6	$11.51	35.6	0.016
3251	Basic chemical mfg.	249.1	227.6	188.4	151.1	$23.83	23.9	1.250
3252	Resin, synthetic rubber, and artificial synthetic fibers and filaments	158.0	139.9	135.6	110.4	$19.03	23.1	0.728
3253	Pesticide, fertilizer, and other agricultural chemical mfg.	52.4	49.9	47.8	40.6	$20.87	20.5	–0.096
3254	Pharmaceutical and medicine mfg.	207.2	227.8	274.4	288.5	$21.31	14.9	1.085
3314	Nonferrous metal (except aluminum) production and processing	109.1	103.1	96.3	71.8	$20.08	37.4	–0.065
3329	Other fabricated metal product mfg.	343.5	317.1	329.8	264.4	$16.58	21.7	0.111
3331	Agriculture, construction, and mining machinery mfg.	228.7	214.6	222.3	209.4	$15.90	37.9	0.207
3332	Industrial machinery mfg.	151.8	164.0	163.2	124.4	$17.80	29.1	0.243
3333	Commercial and service industry machinery mfg.	146.7	143.7	147.1	110.8	$19.18	32.4	0.595
3336	Engine, turbine, and power transmission equipment mfg.	114.1	115.3	111.4	97.1	$18.93	34.3	–0.197
3339	Other general purpose machinery mfg.	335.0	347.0	343.0	264.9	$16.82	34.6	–0.141
3341	Computer and peripheral equipment mfg.	367.4	295.6	301.9	206.5	$22.75	41.8	–2.410
3343	Audio and video equipment mfg.	60.1	53.8	52.1	32.3	$19.96	45.3	0.969
3344	Semiconductor and other electronic component mfg.	574.0	571.0	676.3	451.1	$17.04	35.7	–0.151
3345	Navigational, measuring, electromedical, and control instruments	626.3	482.0	478.6	438.1	$17.70	26.8	–0.022
3353	Electrical equipment mfg.	243.6	219.1	209.7	152.0	$15.32	22.9	0.863
3359	Other electrical equipment and component mfg.	195.0	180.5	190.6	136.4	$15.75	24.1	0.491
3363	Motor vehicle parts mfg.	653.0	786.9	839.5	678.0	$21.09	20.6	–0.142
3364	Aerospace product and parts mfg.	840.7	514.4	516.7	455.5	$24.80	41.7	0.086
3365	Railroad rolling stock mfg.	31.0	34.9	32.8	27.4	$19.98	15.7	1.403

SOURCE: Based on BLS and BEA data.

NOTE: NAICS is the North American Industry Classification System, which is the official government system for classifying industries for the United States, Canada, and Mexico.

The displaced worker survey also determines if a displaced worker is re-employed at the time of the survey. Interestingly, in trade-sensitive industries (including those in import-sensitive industries) the likelihood of re-employment was slightly higher for private service than manufacturing workers; about 72% of private services workers

TABLE 5 Workers who lost jobs between January 2003 and December 2005 by industry of lost job and import sensitivity (in thousands)

	Number displaced[1]	Rate[2]	Jobless 27 weeks or longer[3]
Manufacturing	1,822	11.4	23.9
Import sensitive	1,413	12.1	24.9
Export sensitive	1,218	12.9	25.4
Private services	4,810	4.6	19.5
Import sensitive	659	6.6	19.8
Export sensitive	1,439	6.5	16.9
Other[4]	854	7.6	18.1
Total 20 years of age and over in nonagricultural industries	7,466	5.7	19.6

SOURCE: BLS data.

NOTE: Because displaced worker and unemployment duration by industry data are not available at the 4-digit NAICS level, trade sensitivity was determined at the 3-digit level as follows. If a 3-digit NAICS industry contained a 4-digit industry that was trade sensitive, the 3-digit industry was also deemed trade sensitive. Please see Appendix III for a list of all trade-sensitive industries.

[1] Includes wage and salary workers
[2] The rate is the number of wage and salary workers displaced divided by the total number of both wage and salary workers and the self employed for each industry group. The latter figure was used because detailed industry data by age and class of worker were not available.
[3] Duration of unemployment data from CPS for 2005.
[4] Includes mining and construction.

in trade-sensitive industries were re-employed compared to 65% of manufacturing workers, albeit often at lower wage rates. The duration of unemployment figures in Table 5 show that long-term unemployment (27 weeks or longer) was only slightly higher for traded than nontraded industries in 2005. This finding is consistent with an OECD study that found workers displaced in trade-sensitive industries remain unemployed longer than do workers who lose their job in other industries.[24] Workers with higher post-displacement earnings (and hence likely more skillful) were, however, more likely re-employed, a finding that is consistent with other research.[25]

[24] "Trade-Adjustment Costs in OECD Labour Markets: A Mountain or a Molehill?" OECD Employment Outlook 2005, OECD, July 13, 2005, 23–72.

[25] See Jensen and Kletzer, "Tradable Services."

Policy Implications

This section elaborates potential policy implications of this research and identifies areas for further research to assist policymakers in understanding the rapidly changing economy. Four broad policy implications flow from the analyses in this study.

Greater Federal Support for Services Trade

Trade growth operates under the influence of trade policy, as well as the general health of the U.S. economy. U.S. participation in multilateral trade agreements in the Uruguay Round under the General Agreement on Tariffs and Trade (GATT) resulted in significant market openings for trade in services.[26] The correspondence between the signing of the GATT trade agreements and a boost in trade illustrate the importance of political factors in trade growth.[27]

In a globally integrated world, the costs to U.S. businesses of failing to remain internationally competitive can be enormous. To remain competitive, many U.S. companies are adapting by implementing new technologies, reorganizing work-flows, and contracting out employment—all with the goal of raising productivity. Some of these changes will result in job losses in the United States, while others will result in job gains, as U.S. businesses are better able to export goods and services or are forced to become more efficient. Political attention is more often focused on the costs of global integration rather than the benefits. Competing with imported goods and services will usually lead to job losses if gains in productivity are not large enough to overcome the comparative advantage of low-wage workers prevalent in developing countries. This was summarized nicely by Hafbauer and Warren in terms of services trade but applies to goods trade as well:

> Essentially the costs and benefits of globalization are a function of the increased competition brought by greater exposure to international markets. On the positive side,

[26] This round produced the General Agreement on Trade in Services (GATS) whereby governments cannot discriminate between service suppliers from different countries or between domestic and foreign firms. GATS provides a framework for the negotiated reduction or elimination of barriers to services trade.

[27] See Paul Krugman, Richard N. Cooper, and T. N. Srinivasan, *"Growing World Trade: Causes and Consequences," Brookings Papers on Economic Activity* 1995, no. 1 (25th Anniversary Issue, 1995): 327–77; and Hockman and Mattoo, "Services, Economic Development and the DOHA Round: Exploiting the Comparative Advantage of the WTO," *CEPR Discussion Paper No. 5628*, April 2006, who argue that trade liberalization is only the first step to boosting services trade with developing countries. A second step is necessary because developing countries require substantial strengthening of their domestic regulatory institutions and infrastructure in order to ensure the potential benefits from liberalization are realized. That is, service providers want to be sure that the rules of the game are clear.

> globalization forces down the price of services in high cost locales, increases output and improves service quality. On the negative side, there is the dislocation from increased competition as uncompetitive firms lose market share and their employees are laid off.[28]

Safety Nets for Service Workers

Trade expands markets and leads to economic growth but results in losses as well. The renewed growth of trade as a share of the U.S. economy coincided with the growth of services trade beginning in the 1970s. Policy should support an enabling environment for companies to innovate and expand their markets internationally through more open trade. At the same time, the public provision of an adequate social safety net for domestic workers who lose their jobs as a result of this dynamic process can help offset individual losses and facilitate reemployment.[29] There are workers in industries struggling to compete with low-cost or high-valued imports. Public policy can promote the positive aspects of international trade while helping those caught in its downside. Job and wage losses present risk of social and political opposition. To sustain support for free trade, policymakers must ensure that the gains from such trade are widely shared.

In the United States, policymakers have constructed several general employment service interventions. These general interventions are available to all workers who have lost their job, including service sector trade-displaced workers. Policies include income replacement programs with short-term eligibility requirements like unemployment insurance (UI) as well as education and job resources through One-Stop Centers to help match workers to new jobs and to assess training needs. Publicly funded retraining is, however, very limited.

Policy responses have also been specifically targeted to mitigate the negative effect of job loss due to increased trade. Yet no targeted program accepts trade-displaced workers formerly employed in the service sector. Targeted assistance is available, at the federal level through the Trade Adjustment Assistance (TAA) program, for workers in select manufacturing industries who have lost their jobs due to trade. Job losses, higher displacement rates, and slightly longer unemployment duration among workers in import-sensitive service industries support the argument that TAA could be extended

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[28] Gary Hufbauer and Tony Warren, "The Globalization of Services: What has Happened? What Are the Implications?" Institute for International Economics, October 1999, http://www.iie.com/publications/wp/99-12.pdf#search=%22The%20Globalization%20of%20Services%3A%20What%20has%20Happened%3F%20%20What%20Are%20the%20Implications%22.

[29] "Trade and Structural Adjustment," OECD, 2005, http://www.oecd.org/dataoecd/58/40/34753254.pdf#search=%22Trade%20and%20Structural%20Adjustment%22.

to trade-displaced service-sector workers. We cannot, however, assume that all job loss was due to trade. For example, job losses in the airline industry over the 2000–2005 period occurred as a result of the September 11 terrorist attack as well as from increased import competition from foreign carriers. In either case, the worker is still jobless.

Perhaps a better approach is to abandon targeting altogether, a move that would eliminate the need to establish a cause and effect relationship between job loss and trade. We could strengthen our social safety net through broader tax incentives for companies to train their workers and for workers to obtain training on their own. Health care could be separated from employment, lessening the economic costs of job loss. Government can help to minimize wage losses by assisting displaced and other unemployed workers in finding new jobs quickly. This may require skill training for some of these workers, especially those whose skills have become obsolete. A large body of evidence shows that, where possible, job counseling and retraining should occur in advance of job losses.[30] This is very applicable to the current U.S. job market environment where many of the job losers are low-wage, low-educated workers in non-professional and non-technical occupations. Displacement assistance must balance both the duration of aid and the selectivity and intensity of the intervention as well as provide financial support while similarly encouraging workers to maintain their search for work. The fact that most workers displaced from manufacturing jobs find employment in the same sector underscores the need for any retraining program to direct workers toward careers and employers commensurate with their experience.[31] In sum, offering flexible education and training and providing social safety net systems in the United States would make the economy more responsive to the labor market's changing needs.

Need for Comprehensive Services Trade Data

Although U.S. government trade data-gathering systems and criteria were established at a time when manufacturing dominated U.S. trade, these data systems have not been upgraded to adequately reflect the growth and importance of services trade. The amount and availability of data on services and services trade is extremely limited and rudimentary, particularly in comparison to data available for manufacturing trade.

The lack to date of an adequate policy response for service sector displaced workers may be due to the recent and rapid pace of change. This deficiency is made clear, for

[30] OECD Employment Outlook 2006: *Boosting Jobs and Incomes*, OECD, 2006.

[31] See OECD Employment Outlook 2005, "Trade-Adjustment Costs in OECD Labour Markets: A Mountain or a Molehill?"

example, by the lack of quality data on company behavior regarding the choice of moving work offshore and hiring workers in overseas operations instead of expanding U.S. home-based operations.[32] A lack of quality standardized and accessible data has enabled a delayed policy response. Through improved data collection and empirical study of labor market changes as well as rigorous evaluation of current employment and training programs, however, steps can be taken to address the situation.

Notable as well is the lack of trade in services data provided by NAICS industry. The U.S. Census Bureau provides such data for goods trade. Since BEA already requests the NAICS code from company respondents on several of its services trade questionnaires, it should be able to provide trade in services data by NAICS without much additional funding. These data will help researchers tie trade flows to job flows with more precision.

Areas for Further Research

Research on services trade is in its nascent stage. Few studies have examined this emerging and complex topic. As U.S. service companies engage in global markets, further research will enhance our understanding of these economic changes. Through the analysis completed for this report, there emerged three main areas for further research: geographic concentration of trade-sensitive industries, the growing trade between U.S. multinational companies' foreign affiliates and foreigners, and the connection between service and goods trade.

This study has documented the growing and shifting pattern of trade in private services away from (yet still dominated by) transportation and travel-related services. Like the impact of imports of manufactured goods, the imports of private services disrupt the job market. Since the search for a new job can be hampered by both the industry and the geographic concentration of job losses, useful from a policy standpoint would be to know how concentrated trade sensitive industries are.

Trade in private services is still quite small in comparison with trade in goods, making it difficult to determine those industries that are on the cusp of trading more significantly. It is known that trade-sensitive manufacturing industries tend to be geographically concentrated and therefore possible to build on this notion by identifying the private service industries that are geographically concentrated and hence likely to engage in trade. How do they compare with actual trade in services as measured by

[32] "Data Dearth in Offshore Outsourcing: Policymaking Requires Facts," Office of Senator Joseph Lieberman, December 2004, http://lieberman.senate.gov/documents/whitepapers/Offshoredata.pdf#search=%22Data%20Dearth%20in%20Offshore%20Outsourcing%3A%20%20Policymaking%20Requires%20Facts%22.

BEA, and how do they compare with the list trade-sensitive industries identified in this study? Also possible is a deepening of understanding of the connection between trade in services and the job market, including whether services trade results in increased or decreased wages for U.S. workers.

Secondly, this study revealed that a growing portion of trade in private services is occurring between U.S. foreign affiliates and foreigners. Although not clearly understood, this trend is thought to be related to growing trade in professional and business services. These services often require, or the client demands, close and continuing contact with the service provider. More insight into the possible domestic employment effects of this trend will fill a void in existing knowledge.

Finally, more open trade in services appears to facilitate more trade in goods. This can occur by providing an onsite service capability for specific manufactured products like computers, copiers, and other electronic equipment. The provision of importing services may facilitate companies who want to set up a horizontal supply chain that can take advantage of each country's comparative advantage in producing component parts for a final product. Some quantification and richer understanding of the services-goods trade connection would be valuable.

APPENDIX I

Industry Distribution by Export and Import Penetration Rates, 1997–2004

To determine trade sensitivity, both trade and output data by industry are needed to compute the share of an industry's output that is traded. There are issues with both trade and output data that must be addressed; most problematic are the trade data for services. Manufacturing trade data are available from the International Trade Administration; they follow the Census Bureau's latest NAICS-based trade concordance to approximate the NAICS industry groupings. Exports are limited to domestic exports and are valued "free alongside ship" (FAS); imports are restricted to goods imported for consumption and are on a customs value basis. Output data are from BLS; they are a necessary component of the BLS Employment Projections function. All of these data, except for the trade in services data, are available by industry using the NAICS. Trade in services data are only available by type of services from BEA and had to be concorded to NAICS categories. See Appendix II for a detailed description of the concordance.

Output or value of shipments data distinguishes between industry and product shipments. Shipments data are collected separately for individual factories, or establishments, and not at the company level. Most factories make a variety of products. For statistical purposes, each establishment is classified in the industry identified with its major product. The total output of all plants so classified would make up the "industry shipments" of a specific industry. The value of a product shipped by all establishments manufacturing it, regardless of industry classification, is aggregated to derive "product shipments." Typically, these numbers are not far apart. Output data from the BLS that are product or commodity based were used because (1) all the output data for both manufacturing and services could come from the same source; (2) the great care BLS puts in to building the database, even benchmarking it;[33] and (3) it places the trade numbers and output numbers on a consistent product basis. However, for a few industries the BLS output data were only available at the three-digit level. In these cases, of which there were sixteen, output data from the Census Bureau Economic

[33] The output series are benchmarked to the industry/commodity outputs from the unpublished revised BEA 1997 NAICS based input-output tables, which where adjusted by BLS to reflect the 2002 NAICS revision, NIPA revisions, and to place the data more consistently on a NAICS basis.

1. Distribution of 4-digit NAICS manufacturing industries by average import and export penetration rates, average for 1997–2004

Penetration rates	Imports			Exports		
	Number of industries	Frequency	Cumulative frequency	Number of industries	Frequency	Cumulative frequency
All 4-digit NAICS	85	100.0	–	85	100.0	–
Less than 1%	2	2.4	2.4	1	1.2	1.2
1 to under 2%	2	2.4	4.8	7	8.2	9.4
2 to under 5%	9	10.6	15.4	10	11.8	21.2
5 to under 10%	15	17.6	33.0	18	21.2	42.4
10 to under 20%	23	27.1	60.1	27	31.8	74.2
20 to under 30%	19	22.4	82.5	11	12.9	87.1
30 to under 50%	11	12.9	95.4	11	12.9	100.0
50% or more	4	4.7	100.1	0	0.0	100.0

Censuses were used. Since the Economic Census is conducted every five years, only 1997 and 2002 were available.[34]

[34] Output data for the following industries (NAICS) were taken for 1997 and 2002 from the U.S. Census Economic Surveys: Electronic Shopping and Mail-order Houses (4541), Air Transportation (4811 and 4812), Rail transportation (4821), Water Transportation (4831), Trucking (4841), Support Activities for Transportation (4881, 4882, 4883, and 4884), Depository Credit Intermediation (5221), Nondepository Credit Intermediation (5222), Activities Related to Credit Intermediation (5223), Securities and Commodity Contracts Intermediation and Brokerage (5231), Securities and Commodity Exchanges (5232), and Other Financial Investment Activities (5239). For travel, NAICS 7100 is for 1998. NAICS 481, Air Transportation, from the Economic Survey does not include certificated passenger carriers that report to the Office of Airline Information, U.S. Department of Transportation. These data were retrieved from the Bureau of Transportation Statistics website. For freight other, value of production only include trucks (not rail), but rail typically only accounts for less than 4% of total. (Source: U.S. Department of Transportation, Bureau of Transportation Statistics).

2. Distribution of 4-digit NAICS service industries by average import and export penetration rates, average for 1997–2004*

Penetration rates	Imports			Exports		
	Number of industries	Frequency	Cumulative frequency	Number of industries	Frequency	Cumulative frequency
All 4-digit NAICS	57	100.0	–	57	100.0	–
Less than 1%	31	54.3	54.3	20	35.1	35.1
1 to under 2%	10	17.5	71.8	10	17.5	52.6
2 to under 5%	4	7.0	78.8	7	12.3	64.9
5 to under 10%	2	3.5	82.3	7	12.3	77.2
10 to under 20%	4	7.0	89.3	4	7.0	84.2
20 to under 30%	0	0.0	89.3	3	5.3	88.5
30 to under 50%	5	8.8	98.1	0	0.0	89.5
50% or more	1	1.8	99.9	6	10.5	100.1

NOTE: Frequency distribution may not add to 100% because of rounding. The services trade data are reported by service type and the services employment data are reported by industry. However, there are only 35 types of services trade categories compared to well more than 50 industries of services employment categories. So, each service type can have more than one service industry. Converting or concording the 35 service types to service industries resulted in a listing of 64 service industries. (See Appendix II.)

* Sixteen of the sixty-four service industries were based on 1997 and 2002 averages.

APPENDIX II

Service Types and Corresponding NAICS Codes

1. Service type to NAICS concordance

	Service type	Description	NAICS
1.	**Travel**	Covers primarily the goods and services acquired from the economy by travelers during visits of one year or less (students and health patients can stay longer):	
		• lodging	7211
		• food and drink	7220
		• entertainment	7100
2.	**Passenger fares**	Airline and vessel fares between foreign entities.	481111 481211 483112 483114
	Other transportation		
	Freight	Movement of goods by:	
3.	**Ocean**	Ships	483111 483113
4.	**Air**	Planes	481112 481212
5.	**Other**	Boxcars and trucks	48211 48412
	Port services	Support services such as cargo handling, piloting, fuel, and supplies for crews arriving by:	
6.	**Ocean**	Ships	4883
7.	**Air**	Planes	4881
8.	**Other**	Boxcars and trucks	4882 488490
9.	**Royalties and license fees**	Franchising fees and royalties paid for the use of registered trademarks, patents, copyrights, and licensing fees for use of recordings, computer programs, etc.	5331 5112
	Other private services		
10.	**Education and training**	Expenditures for tuition and living expenses by students studying in foreign countries. Education and training services provided on a contract basis and through distance learning (i.e., Internet).	6110
	Financial	Covers intermediation and auxiliary services.	
11.	**Security transactions**	Includes brokerage, underwriting, and private placement services.	5231 5232
12.	**Management and advisory**	Includes financial management, financial advisory, and custody services.	52392 52393
13.	**Credit card and other credit related**	Credit card transaction fees.	5222
14.	**Other financial**	Includes securities lending, electronic funds transfer, and other financial services.	5221 5223 52391 52399

	Service type	Description	NAICS
15.	**Insurance**	Providing insurance to nonresidents by residents and vice versa. Valued by the service charges in premiums; also includes interest income if provided and commissions.	5241,2
16.	**Telecommunications**	Transmission of sound images or other info by telephone, telex, telegram, radio, television (cable and broadcasting), satellite, e-mail, facsimile including teleconferencing, and support services. Online access services.	5171–5,9
17.	**Misc. (other)**	Personal, cultural, and recreational.	7120 7130
	Business, professional, and technical		
18.	**Computer services**	Computer and data processing.	5415
19.	**Information services**	Database and other information services.	5181 5191
20.	**Management and consulting**	Advisory, guidance, and operational assistance provided to businesses.	5416
21.	**R&D and testing**	Basic and applied research and experimental development of new products and processes.	5417
22.	**Operational leasing**	Leasing and chartering, without operators, of ships, planes, etc. and other leasing arrangements of goods.	5320
	Other		
23.	**Accounting, auditing, and bookkeeping**	Recording of commercial transactions, examination of records/ statements, and tax preparation.	5412
24.	**Advertising**	Design, creation, and marketing of advertisements, including telemarketing and market and opinion research.	5418
25.	**Agricultural, mining, and onsite processing services**	Services incidental to growing crops, breeding, drilling, prospecting, and working on goods imported but with no change of ownership.	1150 2131
26.	**Waste treatment and de-pollution**	Covers the treatment of radioactive waste, stripping work of contaminated soil, cleaning up of pollution, decontamination services, and sanitation.	5620
27.	**Architectural, engineering, and other technical**	Design, planning, supervision, testing, certification, and inspection. Also includes industrial engineering.	5413
28.	**Construction**	Work performed in location outside of the territory of the enterprise.	2300
29.	**Installation, maintenance, and repair of equipment**	Maintenance services primarily to machinery and equipment.	8113
30.	**Legal**	Legal advisory and representation services and drafting documents.	5411
31.	**Medical**	Health services provided by doctors, nurses, and other professionals and laboratory and similar services.	6211 6215 6220
32.	**Misc. disbursements**	Outlays intended: to fund news-gathering costs of broadcasters and of print media and production costs of motion pictures and broadcast program material other than news; to maintain government tourism and business promotion offices; and for sales promotion and representation. Also includes rentals and license fees for rights to distribute pre-recorded film and TV tapes.	5111 5120

	Service type	Description	NAICS
33.	**Sports and performing arts**	Fees to actors, directors, and producers involved in theatrical and sporting events.	7110
34.	**Trade-related**	Consist of auction services, Internet, or on-line sales services, and services provided by independent sales agents. For exports, "merchanting" services are also included and measured as the difference between the cost and resale prices of goods that are purchased and resold abroad without significant processing. For imports, the value of these services is included in the value of the goods.	4541
35.	**Other business, professional, and technical**	Consists of language translation services; security services; collection services; salvage services; satellite photography and remote sensing/satellite imagery services; transcription services; mailing, reproduction, and commercial art services; personnel supply services; and management of health care facilities services.	5419 5614 5616

NOTE: Description from *Manual on Statistics of International Trade in Services*, section on "Definitions of the components of the Extended Balance of Payments Services (EBOPS) classification." Since BEA Since BEA does not follow all of the provisions for classifying services transactions as recommended under the EBOPS system, the following sources were also used: BE-22—Annual Survey of Selected Services Transactions with Unaffiliated Foreign Persons; BE-25—Quarterly Survey of Transactions Between U.S. and Unaffiliated Foreign Persons in Selected Services and in Intangible Assets; BE-45—Quarterly Survey of Insurance Transactions by U.S. Insurance Companies with Foreign Persons; and BE-85—Quarterly Survey of Financial Services Transactions Between U.S. Financial Services Providers and Unaffiliated Foreign Persons.

APPENDIX III

Export- and Import-Sensitive Industries, 1997–2004

1. Export-sensitive manufacturing industries, 1997–2004

Number	NAICS	Industry
1.	3132	Fabric mills
2.	3159	Apparel accessories and other apparel manufacturing
3.	3161,9	Leather and hide tanning and finishing and allied product manufacturing
4.	3251	Basic chemical manufacturing
5.	3252	Resin, synthetic rubber, and artificial synthetic fibers and filaments
6.	3253	Pesticide, fertilizer, and other agricultural chemical manufacturing
7.	3254	Pharmaceutical and medicine manufacturing
8.	3314	Nonferrous metal (except aluminum) production and processing
9.	3329	Other fabricated metal product manufacturing
10.	3331	Agriculture, construction, and mining machinery manufacturing
11.	3332	Industrial machinery manufacturing
12.	3333	Commercial and service industry machinery manufacturing
13.	3336	Engine, turbine, and power equipment manufacturing
14.	3339	Other general purpose machinery manufacturing
15.	3341	Computer and peripheral equipment manufacturing
16.	3343	Audio and video equipment manufacturing
17.	3344	Semiconductor and other electronic component manufacturing
18.	3345	Navigational, measuring, electromedical, and control instruments manufacturing
19.	3353	Electrical equipment manufacturing
20.	3359	Other electrical equipment and component manufacturing
21.	3363	Motor vehicle parts manufacturing
22.	3364	Aerospace product and parts manufacturing
23.	3365	Railroad rolling stock manufacturing

NOTE: Export sensitivity is either an average export penetration rate of 20% or more or an average annual percentage point increase of 1.0 or more.

2. Import-sensitive manufacturing industries, 1997–2004

Number	NAICS	Industry
1.	3151	Apparel knitting mills
2.	3152	Cut and sew apparel manufacturing
3.	3159	Apparel accessories and other apparel manufacturing
4.	3161,9	Leather and hide tanning and finishing and allied product manufacturing
5.	3162	Footwear manufacturing
6.	3254	Pharmaceutical and medicine manufacturing
7.	3271	Clay product and refractory manufacturing
8.	3311	Iron and steel mills and ferroalloy manufacturing
9.	3314	Nonferrous metal (except aluminum) production and processing
10.	3322	Cutlery and handtool manufacturing
11.	3325	Hardware manufacturing
12.	3326	Spring and wire product manufacturing
13.	3329	Other fabricated metal product manufacturing
14.	3331	Agriculture, construction, and mining machinery manufacturing
15.	3332	Industrial machinery manufacturing
16.	3333	Commercial and service industry machinery manufacturing
17.	3335	Metalworking machinery manufacturing
18.	3336	Engine, turbine, and power transmission equipment manufacturing
19.	3339	Other general purpose machinery manufacturing
20.	3341	Computer and peripheral equipment manufacturing
21.	3342	Communications equipment manufacturing
22.	3343	Audio and video equipment manufacturing
23.	3344	Semiconductor and other electronic component manufacturing
24.	3346	Manufacturing and reproducing magnetic and optical media
25.	3351	Electric lighting equipment manufacturing
26.	3352	Household appliance manufacturing
27.	3353	Electrical equipment manufacturing
28.	3359	Other electrical equipment and component manufacturing
29.	3361	Motor vehicle manufacturing
30.	3363	Motor vehicle parts manufacturing
31.	3369	Other transportation equipment manufacturing
32.	3371	Household and institutional furniture and kitchen cabinet manufacturing
33.	3399	Other miscellaneous manufacturing

NOTE: Import sensitivity is either an average import penetration rate of 20% or more or an average annual percentage point increase of 2.0 or more.

3. Export-sensitive service industries, 1997–2004

Number	NAICS	Industry
1.	4811	Scheduled air transportation
2.	4812	Nonscheduled air transportation
3.	4821	Rail transportation
4.	4831	Deep sea, coastal, and great lakes water transportation
5.	4841	General freight trucking
6.	4881	Support activities for air transportation
7.	4883	Support activities for water transportation
8.	5112	Software publishers
9.	5239	Portfolio management, investment advice, and other financial investment activities
10.	5320	Rental and leasing services
11.	5331	Lessors of nonfinancial intangible assets (except copyrighted works)
12.	7100	Arts, entertainment, and recreation
13.	7211	Traveler accommodations
14.	7220	Food services and drinking places
15.	8113	Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance

NOTE: Export sensitivity is either an average export penetration rate of 10% or more or an average annual percentage point change of 0.4 or more.

4. Import-sensitive service industries, 1997–2004

Number	NAICS	Industry
1.	4811	Scheduled air transportation
2.	4812	Nonscheduled air transportation
3.	4821	Rail transportation
4.	4831	Deep sea, coastal, and great lakes water transportation
5.	4841	General freight trucking
6.	4881	Support activities for air transportation
7.	4883	Support activities for water transportation
8.	5112	Software publishers
9.	5241	Insurance carriers
10.	5242	Agencies, brokerages, and other insurance related activities
11.	5331	Lessors of nonfinancial intangible assets (except copyrighted works)

NOTE: Import sensitivity is either an average import penetration rate of 10% or more or an average annual percentage point change of 0.4 or more.

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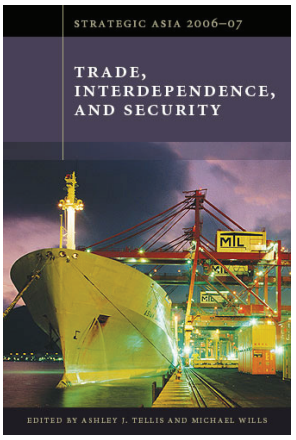

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